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Above I-35

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Above I-35

by

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Report

Presented to the Faculty of the Graduate School of

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Dedication

I dedicate this work to my parents for their faith in my dreams.

Acknowledgements

I am grateful to my supervisors Jacob Wegmann and Robert Paterson who guided me in shaping this study and in exploring ideas towards making this a strong proposal. My utmost appreciation to Sinclair Black for his forward thinking and his dedication towards pedestrian oriented street designs, and for allowing me to assist him in his vision for I-35 through downtown Austin. I also thank Heyden Black Walker for her encouragement, which pushed me to work hard on this project. I am indebted to my coworkers at Black+Vernooy Architecture and Urban Design for their immense support and for connecting me to professionals in the field.

A special thank you to Michael Oden for his model for tax estimation which has an extensive application in this project. I would also like to thank Angeliz Encarnacion and Stephen Zigmund for their help through parts of this project.

Abstract

Above I-35

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The University of Texas at Austin, 2018

Supervisor: Jacob Wegmann

Growth of a city calls for choices to be made, and given its rapid pace, Austin's growth requires smart solutions. The void created by an insufficient transit system creates the need for more people to drive to work/school. This in turn generates a greater need for wider roads and more lanes for people to drive on. On the 30th of November, 2017, the Texas Department of Transportation announced its plans to lower I-35 in Downtown Austin and add two managed lanes in each direction. The project would have allowed for faster commutes for some of the north- or southbound drivers, provided they chose to pay variable toll rates. This, in the longer run, would have generated substantial revenue for TxDOT but failed to promote east/west connectivity and to solve the traffic congestion problem Austin is dealing with today. There has been a lot of political involvement in the decision-making processes, because of which we do not know if TxDOT plans on rethinking the project.

This project, as per Architect, Planner and Urban Designer, Sinclair Black's Vision, revolves around addressing the primary issue of congestion and emphasizing on how through smarter and farsighted solutions, we can advance towards a more prosperous Austin. The key solutions include depressing and capping the highway, reclaiming valuable downtown land and returning it to the City of Austin for revenue generating real estate development. This will reconnect the city grid, minimize congestion, diminish pollution,

and provide dedicated public transit corridor lowering overall commute times. This project largely focuses on estimating the taxable property and the property taxes generated through the deployment of this idea.

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Introduction- The High Costs of Highways

Successes and failures are part of a city's growth and as Jeffrey Tumlin notes, "Austin has a problem of success." (Tumlin is the Principal and Director of strategy at Nelson\Nygaard, San Francisco). Austin's thriving economy is resulting in the creation of new jobs, thus a lot of people are moving into the city. Austin's growing housing stock is capable of accommodating the population but its roads and streets, not so much. For decades, cities have tried to solve their past and current mobility issues by making changes to their urban fabric. The most significant change has been increasing the number of lanes by widening the roads, to get people across and between towns and cities as quickly as possible. Planners in the past have focused their efforts on finding solutions to the most immediate concerns, not necessarily anticipating and taking into consideration the future needs of the city.

Recently, toll lanes were added on Mopac Expressway through the $200 million MoPac Improvement Project. The project's website shed light on the benefits and improvements that the project would bring as follows:

> *"Initially, the addition of an Express Lane in each direction may reduce some of the congestion in the general purpose lanes. Over time, these benefits will decrease as traffic continues to grow. However, variable tolls in the Express Lanes are intended to keep traffic in the Express Lanes free flowing over the long term giving buses, van pools and drivers who choose to use the Express Lanes a faster and more reliable trip."*[1]

The long lasting trend of addressing the most immediate concern at hand is evident here. Texas Department of Transportation (TxDOT) acknowledges the fact that although the express lanes would help reduce some congestion in the immediate future, the benefits will fade over time. An example of induced demand is the Katy Freeway (stretch of I-10 west of Houston). The freeway underwent a massive widening project in 2012 which reduced congestion for a few years, but a study in 2015 noted that morning and afternoon commutes had increased by 23 and 25 minutes respectively.[2] The Law of *Induced* or *Latent Demand*, as per the *Economic theory of Supply and Demand* suggests that supply and consumption of a commodity increase simultaneously, hence

[1] http://www.mopacexpress.com/about/faq.php
[2] http://cityobservatory.org/reducing-congestion-katy-didnt/

more lanes equals more vehicles on the road.[3] This explains the fact that no matter how many lanes we add to our roads, the issue of congestion will never be addressed. Before we move further ahead in the same direction, following the same set of rules and principles, I believe it is time that the needs of our city be analyzed, keeping in mind a future with more efficient mobility.

In a city like New York, a large population is dependent on the subway because the transit network is extensive, efficient, and affordable. Austin has a good north south bus connectivity but needs a decent east west improvement. Proposals for highways from east to west were shot down as they required demolishing large swaths of neighborhoods and regardless, the hunger for more road space would have never been satisfied.

The *Law of Induced Demand* states that congestion is the equilibrium point in the demand and supply system and implies that we cannot expect to solve our mobility related problems by increasing the number of lanes. I would agree and argue that *Latent Demand* also plays a vital role. This refers to the people who made a different choice, for instance they were working from home but prefer going to the office when the highway has lesser traffic. It is pretty understandable that these improvements are good until everyone decides to use the highway and it fills back up again. Cars being the most convenient mode of transportation for short trips, "A small shift can make a big difference."[4] Cars use ten times the road space in comparison to a pedestrian, bicyclist or a person using transit.[5]

The Texas Department of Transportation recently revealed its plans to add two new "managed lanes" (free for transit with a variable toll for cars and trucks) in each direction to I-35. We need to reflect upon the past and ask ourselves if the addition of the two lanes this time would be the solution of the long standing problem of congestion. The variable tolled managed lanes would likely bring in substantial amount of revenue, and provide a consistent 45 mph speed for those paying the toll. This also means that the toll revenue would increase with increased congestion as more people would prefer not being stuck in traffic. These highways are built by selling bonds and the revenue generated from these lanes would go towards paying the bond and further provide TxDOT with future funding for more roads and highways, but the cycle of adding lanes will not come to a halt unless we choose to get our priorities right. Adding toll lanes may

[3] https://usa.streetsblog.org/2017/06/21/the-science-is-clear-more-highways-equals-more-traffic-why-are-dots-still-ignoring-it/
[4] http://www.austintexas.gov/edims/pio/document.cfm?id=255872
[5] http://www.austintexas.gov/edims/pio/document.cfm?id=255872

help relieve some congestion but is not a long term fix for the problem of congestion. The city today calls on us to be the change and foresee the needs of the future.

We tend to refrain from taking into account the value of time when making such arguments. Reducing commute time to work by either relocating closer to work or riding a fast, reliable and efficient public transit system with dedicated lanes can save time, and reduce mental stress caused while stuck in traffic instead of being at work. Choosing to take public transit over driving also saves us money and from the trouble of having to find and afford downtown parking. As a matter of fact, a lot of work can be done while riding the transit systems. You must have often seen people reading books, or typing emails when on public transit. Going by the *Economic theory of Supply and Demand*, providing affordable housing choices closer to workplaces will lead to people relocating and reduced congestion on the roads. The major demographic would be that of service industry workers, who could make shorter trips within the city and consume less space on the highways. This will potentially free up a lot of space on I-35, eliminating the need for more lanes, and again we can keep on widening our roads but the need as has been discussed over and over again will never be satisfied.

I-35 today also acts as a major barrier, dividing Austin into two parts, east and west, the eastern part being less privileged. Austin is one and there should be no divide. We all are familiar with the historic concentration of minorities on the eastern side of *East Avenue* (as the I-35 corridor was called before it was widened into a freeway). For long, we have been trying to rewrite our mistakes and a major change can be made by lowering and capping the highway and allowing the city to reconnect with east-west surface boulevards.

I-35 also creates a lot of pollution. By residing alongside major highways, children and teenagers are the ones at maximum risk, but this does not mean that they are the only ones affected. Health Effects Institute's January 2010 review mentions that a panel of expert scientists, reviewing the available evidence, concluded[6] "that traffic pollution causes asthma attacks in children, and may cause a wide range of other effects including: the onset of childhood asthma, impaired lung function, premature death and death from cardiovascular diseases, and cardiovascular morbidity." The problem of congestion on I-35 is well known to all of Austin, and looking at the various impacts of highways on our cities today, it is required that we move towards smarter solutions rather than promote the same, redundant techniques.

[6] http://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/highways.html?referrer=https://www.google.com/

Sinclair Black wants to reconnect the grid throughout downtown Austin. He, along with urban planner Heyden Black Walker and many other concerned citizens, has been pushing for the change since 1997. He is also the principal of Reconnect Austin, a nonprofit which has been advocating for the vision of a reconnected Austin, supporting east/west connectivity. The portion of Downtown Austin along I-35 holds immense potential for real estate development. This study's focus is on a proposal to depress the highway from Cesar Chavez to 11th street and plan for mixed use development on the portion of the land reclaimed from the current frontage roads, which will be rebuilt as East Avenue Boulevard on top of the depressed highway. Along the way, I will also be looking into the Congress for New Urbanism's (CNU's) Highways to Boulevards project, focusing on the model cities and their advocacy for "replacing urban freeways with surface streets, boulevards and avenues as the most cost-effective, sustainable option for cities grappling with aging grade separated roads."[7]

I have researched the environmental and economic feasibility of this project. I-35 has long acted as a barrier to potential development and access in East Austin. With vehicular speeds up to 65 mph, the highway does not create a safe and clean environment for people living and working in the properties alongside. Depressing and capping the highway could be the catalyst that leads to a more prosperous Austin, spurring immense growth and economic development in the center of the city. The potential development that could take place could allow for better proximity and access for service industry workers to downtown jobs as well as affordable housing.

This project will focus on economic development of Downtown Austin and also the removal of I-35 as a barrier to development and growth of Downtown Austin. This will be achieved by grade separation. The traffic on I-35 will flow below grade, allowing the surface to return to the city in the form of boulevards and reconnecting the urban fabric. This will all be in alignment with the Great Streets Master Plan and Reconnect Austin's vision of a better and connected Austin. This research will look at the kind of development that could be built using suitability analyses, estimation of the cost for depressing and capping the highway, and the economic and social benefits it would bring for the city and for the residents of the area.

[7] https://www.cnu.org/our-projects/highways-boulevards/freeways-without-futures

The Urban Fabric: *A Photographic Insight into the Study Area*

The following images have been compiled from various sources to provide an understanding of the study area and the issues. Over past decades, the right-of-way has transitioned from East Avenue to I-35, with addition of more and more lanes for a larger number of vehicles to travel at greater speeds. As is evident, the practice of adding lanes has not been very successful at solving the issue of congestion. Later chapters will talk about the solutions which could help mitigate the current conditions.

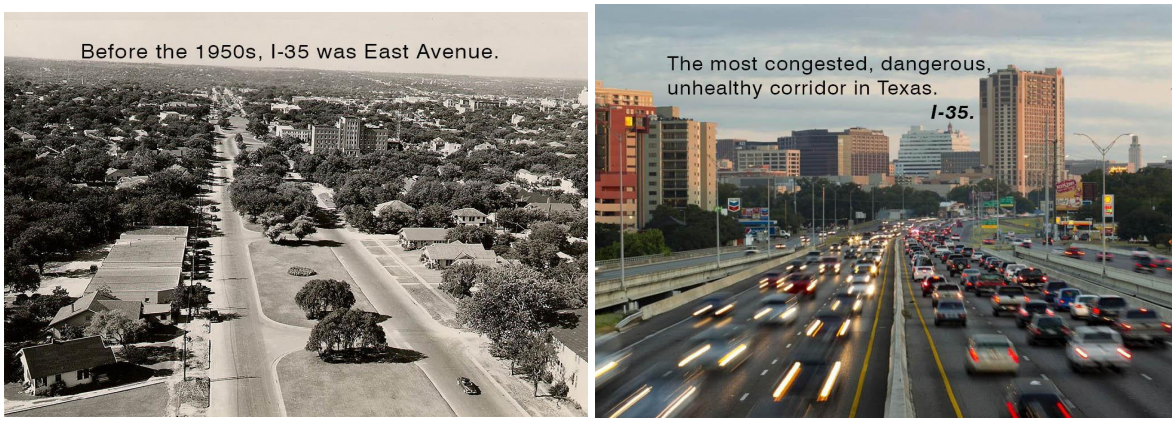

Figure 1: From East Avenue to I-35

Source: https://reconnectatx.wordpress.com/

Figure 2: East Avenue Right of Way

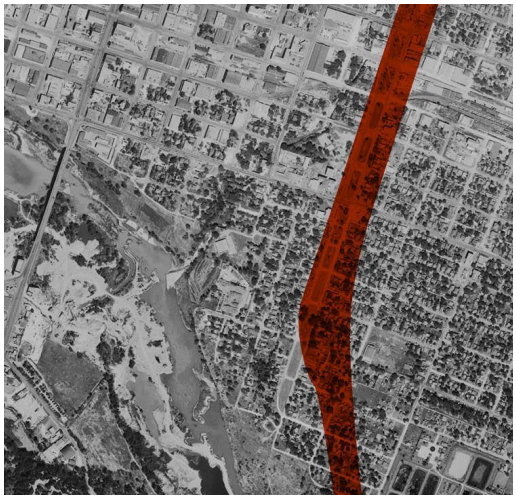

Figure 3: I-35 Right of Way taken from East Avenue and City of Austin

Source: https://reconnectatx.wordpress.com/

Figure 4: Delineation of disparities in the urban form on either side of I-35

Source: Google Earth

Figure 5: Study Area: Cesar Chavez Street to 11th Street, Austin, Texas

Source: Google Earth

Figure 6: Second Street District, Austin before and after the implementation of great streets masterplan

Source: https://reconnectatx.wordpress.com/

Figure 7: A photograph looking west across I-35 (elevated on viaduct), towards the eastern side of downtown Austin

Figure 8: Interactive spaces in Downtown Austin, on the western side of I-35

Source: Black+Vernooy Architects and Urban Design

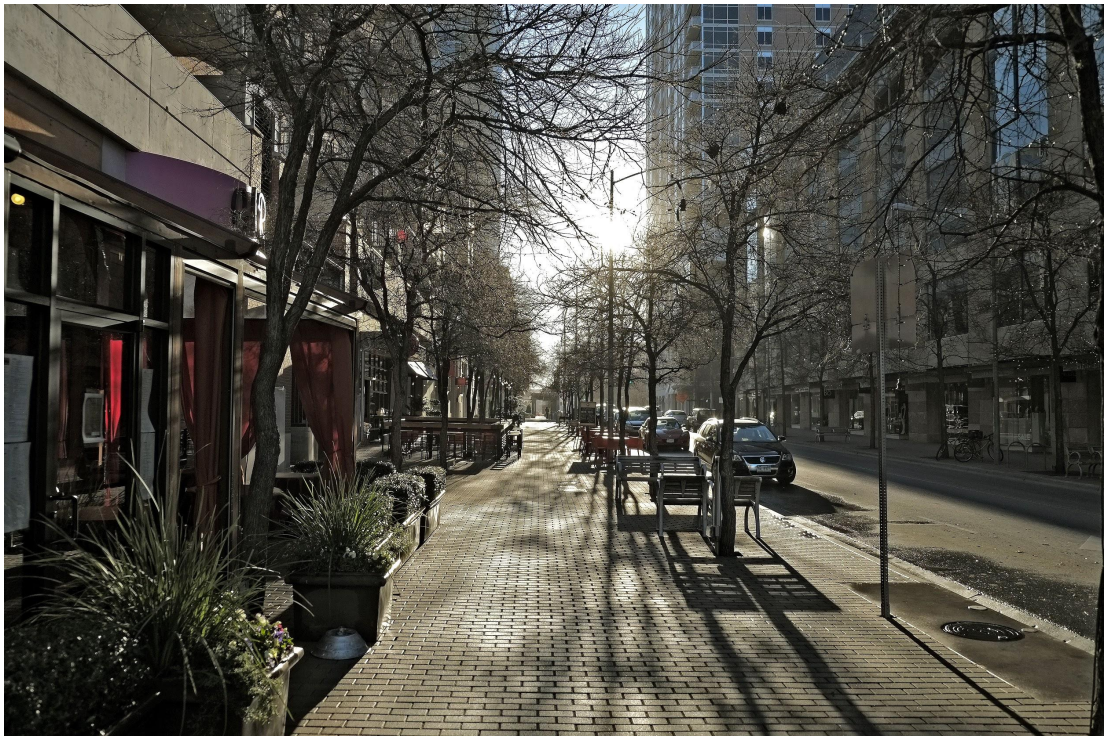

Figure 9: From an urban design perspective, wide sidewalks promote walkability

Source: Black+Vernooy Architects and Urban Design

Figure 10: Interactive public space on Lavaca at 2nd street

Source: Black+Vernooy Architects and Urban Design

Figure 11: Apartments along I-35. Residents breathe polluted air, and are exposed to health risks

Figure 12: Homeless people living under the highway, exposed to severe air pollution.

Figure 13: I-35 acts as a physical barrier for pedestrian access

History and Context: Setting the Stage

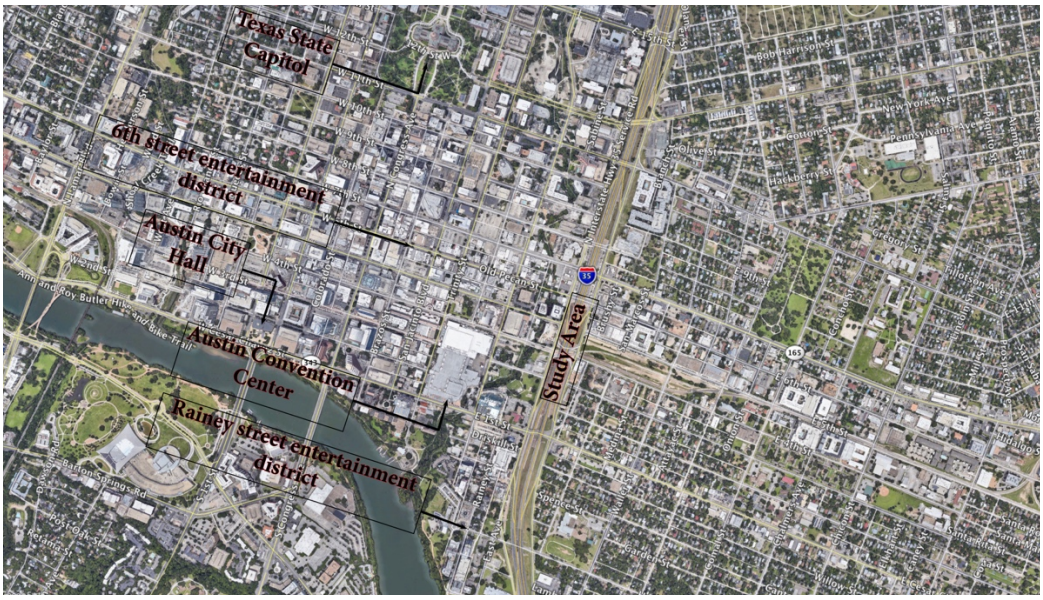

Figure 14: Study Area in context to major landmarks in Downtown Austin

Source: Google Earth

How many miles a day do people walk? It certainly varies from place to place. Time and again we tend to forget that our cities belong to us and we all have a shared responsibility towards them. Over the past few decades, we have deprioritized living in walkable surroundings and having access to interactive spaces. Around May of last year, I was visiting New York City and, I ended up walking for 14 Miles in one day. I have been living in Austin for the past two years but unfortunately, never felt comfortable walking for more than 3-4 miles, except if it is on the Barton Creek Greenbelt. I believe that accessibility plays a major role in this. New York on one hand has wide sidewalks with stores lined up right alongside, whereas in Austin, we have dead parking lots lined up right next to our uneven? sidewalks. This has been coupled with a disconnected city grid, I-35 dividing Austin into east and west.

In 2001, Sinclair Black along with a team of consultants created the "Great Streets Master Plan". The master plan's implementation with Second Street in downtown Austin has over time changed the way the district has been utilized. To put it in simple terms, the street was used to get traffic through downtown as quickly as possible but the plan shifted the priority from speed and cars to pedestrians. Today, the 2nd Street District is a vibrant urban space with wide walkable sidewalks lined with trees and cafes and stores which allow Austin's residents to walk and interact.

Implementation of the Great Streets Master Plan has proven to be a boon for the Second Street District in Downtown Austin, with increased economic activity and the tax base benefitting all the tax collecting agencies. It is our responsibility today to take steps towards a connected Austin by reclaiming and recreating spaces that are meant to be pedestrian oriented. This change can be a step towards a more dynamic future.

Figure 15: Katy Freeway (I-10) within and outside Houston

Source: Google

Above is an image of the Katy Freeway (I-10) in Houston, and I am wondering how many people would want to live alongside such a polluted corridor. Research has proven that being exposed to such pollution can hamper the mental growth of children and lead to respiratory diseases in adults. Alongside it is another image of Katy Freeway, but from outside Houston. One would wonder why such a drastic change? How is there so much more traffic on these highways within the city? This is a common scenario, because most of the traffic on these highways is from within the city, i.e. majority of the population is that of people who drive to work. Now why do these people who drive to work choose to be stuck in traffic and waste their money on gas and deal with frustration caused by traffic? Many people choose to "drive till you qualify," meaning that families are looking for lower cost housing at the outskirts, and the tradeoff is longer and longer commutes to jobs. Below are a few examples of how cities have stepped up and fixed their urban fabric to make more livable communities and spaces that we enjoy and appreciate:

Figure 16: Highway M-30 Madrid, before /after

Source: eoi.es[8]

Along the river *Rio Manzanares* in Madrid, highway M30 was buried and parks, playgrounds, and infrastructure were built on it. This provided space for placemaking and as can be seen from the above images, is aesthetically appealing. The park was opened to the public on the 15th of April, 2011.

Figure 17: Woodall Rodgers freeway (left, before freeway cap) and Klyde Warren park (right, after), Dallas.

Source: landscapeperformance.org, aimages.railstotrails.org

Of the two images above, which one would you like to be a part of? Which one do you think follows the idea of placemaking? Probably not the first one as the space is only for cars.

"Building a 5-acre deck park over a recessed eight-lane freeway took an imaginative and hard-working team of Dallas leaders and a clear vision. Klyde Warren Park creates green

[8] http://www.eoi.es/blogs/imsd/project-management-rio-madrid-project/

space "out of thin air" that connects the vibrant Uptown neighborhood with the Dallas Arts District and downtown.

The increased pedestrian connectivity and natural landscape heals the urban fabric of the city. The park is envisioned as a catalyst for the ongoing transformation of downtown Dallas by bringing quality of life, foot traffic to the area and increasing demand for surrounding properties. Leaders envision a place where people can build new traditions, share experiences and have fun in the center of Dallas. Public parks strengthen our communities and benefit our health, environment, quality of life, and economy. These are benefits that Dallas will enjoy for generations to come."[9]

The above excerpt from Klyde Warren Park's website points out the solution to many issues that highways create when they divide cities. Klyde Warren Park "connects" neighborhoods of Uptown to Downtown Dallas and the Arts District. The park "heals the urban fabric" by instilling elements such as natural landscaping, which improve pedestrian connectivity and safe access across the highway. Klyde Warren park was also awarded Urban Land Institute's urban open space award in 2014, having been evaluated for various parameters.

"Construction of the park over an existing freeway has numerous environmental benefits, including the sequestration of an estimated 18,500 pounds (8,400 kg) of carbon annually, interception of 64,000 gallons (242,000 liters) of stormwater runoff, and a marked reduction in temperature, air pollution, and noise."[10]

Figure 18: I-35 in Downtown Austin

Source: Google Earth

[9] https://www.klydewarrenpark.org/About-the-Park/our-story.html
[10] https://urbanland.uli.org/planning-design/uli-urban-open-space-award-finalists-kylde-warren-park/

Figure 19: I-35 Outside Austin

Source: Google Earth

The above images are of I-35 inside and outside of Austin. As can be seen from the images, I-35 in downtown Austin is 8 lanes wide with 4 lanes in each direction, and the frontage roads are 3 lanes in each direction, for a total of 14 lanes. This gets worse as the highway further north branches out into upper decks and below grade lanes, along with frontage roads. By contrast, I-35 outside Austin is 6 lanes wide with 2 lanes in each direction for frontage roads, for a total of 10 lanes. One would think that we need wider highways for our daily commute but, we can narrow the highway's footprint through downtown, build intra-city metro rail/tram connectivity for a convenient and faster commute to work, and build more affordable housing on the land now occupied by the highway in the heart of our city. This would release a lot of congestion from the highway, as people will be able to afford living closer to work, eliminating the need for a lot of people to drive to work, and public transit with dedicated lanes will provide faster commute without being stuck in traffic.

The following are screenshots of a video by PTV Group, a traffic and logistics software and technology company. The video imagines a race between a certain number of people using different modes of transportation and the road space occupied by these modes to be able to cross a finish line at the same time. The clear winners are buses and trams while cars are the least efficient and require the most space.

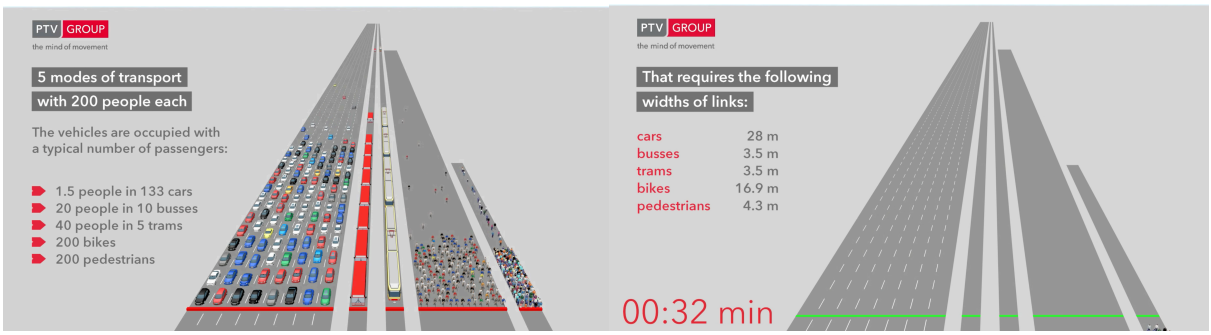

Figure 20: Modes of Commute- Relationship between Time and Utilization of Road Space

Source: PTV Group [11]

My project revolves primarily around the concept of building affordable housing, retail, and office spaces on the reclaimed land by depressing the highway. The boulevard above the highway would be more welcoming to pedestrians, and will be the solution to east-west connectivity by helping restore the city's broken street grid. The boulevard above and the highway below would also have dedicated lanes for street cars. Affordable housing will enable workers to live closer to work while having access to amenities that the city has to offer. The street cars will provide a mode of reliable and faster transit to get to the city center and promote greater economic activity. This increased activity in Downtown Austin will in turn create a greater tax base thus benefiting entities such as the City of Austin, the Austin Independent School District, etc., not to mention the ripple effect, similar to the boost in the economy that the Great Streets improvements to Second Street brought. Overall, this Transit Oriented Corridor will uplift Austin's economy, making I-35 a major corridor promoting mobility and with reduced pollution, will make this corridor much safer to live along.

[11] https://www.treehugger.com/urban-design/how-much-space-do-people-take-different-modes-transport.html

Methodology

This project represents Sinclair Black's vision of a reconnected Austin. All the building types in the following section are based on his decades of experience in the Architecture, Planning, and Urban Design fields. The building layouts are based on the existing AMLI Downtown and AMLI on 2nd mixed-use buildings in Downtown Austin.

Since the implementation of this project would require the highway to be depressed and capped, I have estimated the expenditure it would take to do so. The estimates are based on a study published by the Texas Department of Transportation in the year 2013. The right of way on I-35, from Cesar Chavez to 11th street, is approximately 24.5 acres. As per a study, in the year 2013, the cost to cut and cap the highway is $471 per square foot, i.e. about $500 million for this section.[12]

The Fiscal Impact Model used to calculate all revenue sources was created by UT Professor Michael Oden. The model calculates revenues for the City of Austin and Austin Independent School District, including utility revenue. The model is designed in a way that it calculates the annual operating costs to support the growth, and subtracts these from the overall revenues generated to provide an estimation of the Net Cost, which in this study refers to the net monetary profit. The proposed development on the reclaimed land results in $23.4 Million net revenue on an annual basis in the form of taxes at the end of 20 years. The Net Present Value of the cumulative new net revenue over the 20 year development period is approximately $333 Million.

The Fiscal Impact Model Spreadsheet is attached in Appendix 1. The *Baseline* tab in the spreadsheet has been populated with parameters for calculating Revenues and Expenditures: Property Taxes, Sales and Excise Taxes, Non-Tax Revenue, revenues generated from utilities, community operations and capital expenditures, and educational expenses. Information regarding the building types and their percent share of uses—Residential, Retail, Office, or Hotel—have been logged in the *Development Type* tab. These two tabs combined provide the Return on Investment estimates in the *Preferred Scenario Analysis* tab of the model spreadsheet. The Revenues generated have been further discussed in the Return on Investment section.

[12] http://ftp.dot.state.tx.us/pub/txdot/my35/capital/implementation-plan/travis/travis-appendix-c.pdf

The Development Proposal

The following tables have been obtained from Capitol Market Research (Charles Heimsath, personal communication, February 14, 2018), specializing in real estate research, land development, and market analysis. The tables contain information regarding the real estate market trends from over the past decade in Downtown Austin. This includes retail and office spaces added and absorbed and total apartment units and units absorbed, per year. This provides us with estimates on the absorption capacity for the phasing of the development proposal.

RETAIL		
Year	Space added (sq ft)	Space absorbed (sq ft)
2009	9,830	5,070
2010	22,270	20,470
2011	12,280	11,460
2012	22,100	4,910
2013	12,770	26,680
2014	24,230	48,280
2015	12,780	40,920
2016	38,470	40,920

Table 1: Retail spaces added and absorbed, 2009-2016

OFFICE		
Year	Space added (sq ft)	Space absorbed (sq ft)
2009	202,000	449,975
2010	0	467,763
2011	54,684	78,299
2012	0	304,046
2013	17,540	(94,361)
2014	555,097	988,652
2015	331,685	417,652
2016	202,592	247,771
2017	741,509	380,339

Table 2: Office spaces added and absorbed, 2009-2017

MULTI-FAMILY		
Year	Units Added	Units absorbed
2009	722	764
2010	292	403
2011	(2)	(39)
2012	7	88
2013	583	279
2014	440	554
2015	554	471
2016	764	507
2017	0	259

Table 3: Total apartment units and absorbed, 2009-2017

These figures indicate the continued growth and demand cycle over the past few years, especially for office space. Downtowns are typically the main economic engine for a metropolitan region and office spaces are essential for business activities. The main purpose for allocating space for residential use is to make room for affordable housing units as those are deeply rooted in the idea of this project. The affordable units will be allocated to workers who currently commute from the outskirts to the city center on a daily basis. This will allow them to get to work much faster, save on expenses towards their vehicles and be a part of the city they serve. This project has estimated the maximum property taxes that could be generated based on the proposed building types and thus for housing to be affordable, subsidies would have to be provided and thus the property taxes would also be reduced.

Building Layout and Description

Following is a map for the building layout along the corridor (a detailed description of each of the buildings including square footages and percentage mix of different uses can be found in Appendix I). The building dimensions and layouts have been proposed based on the space restrictions imposed by Waller Creek and also existing and upcoming development projects. A few blocks as can be seen in the layout do not have proposed buildings on them for the same reason. The layout does not take into consideration any allowable height restrictions that could be imposed by the Capitol View Corridor. The Capitol View Corridor ensures the visibility of the Texas Capitol from various points around the city by imposing building height restrictions along those corridors.

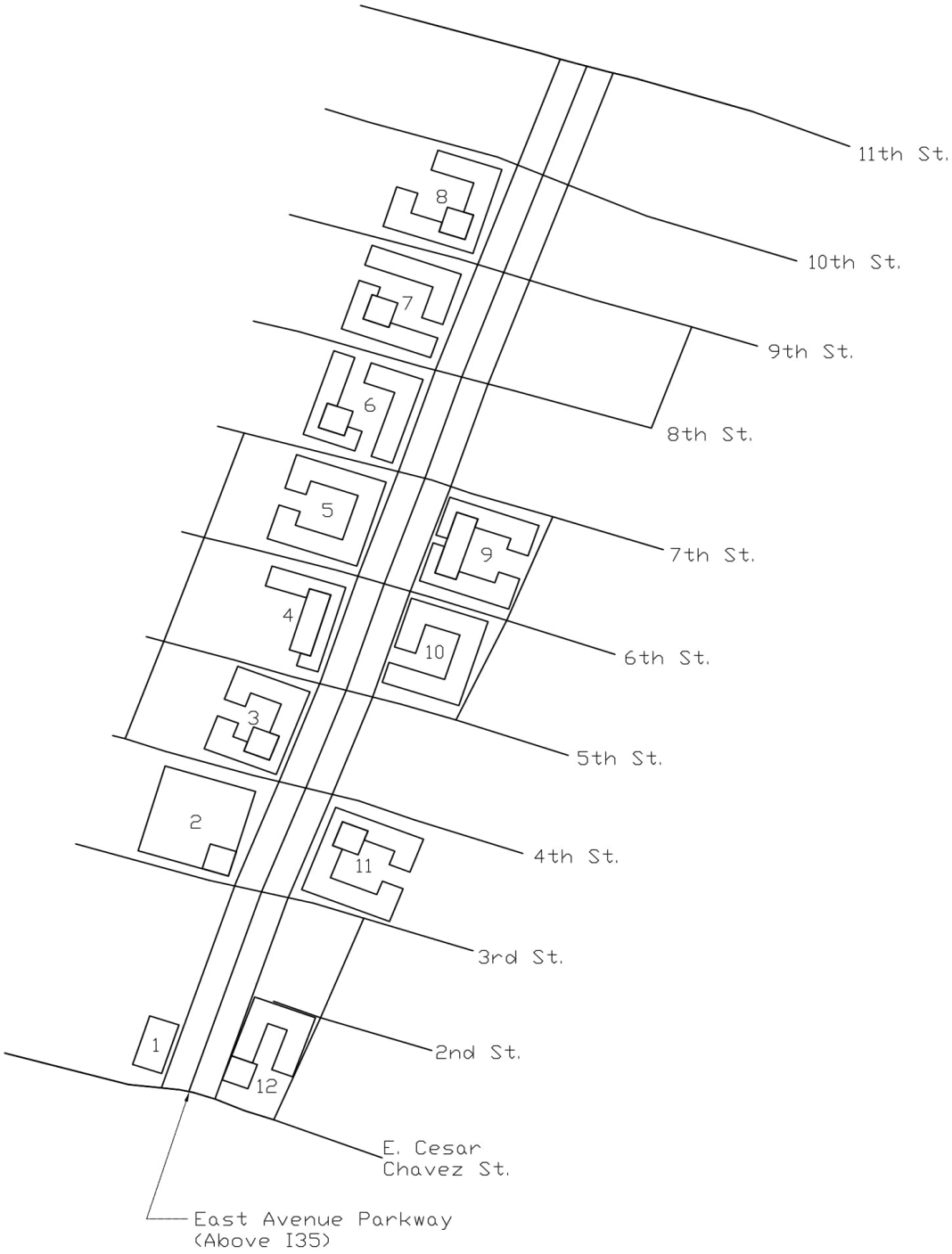

Figure 21: Building Layout

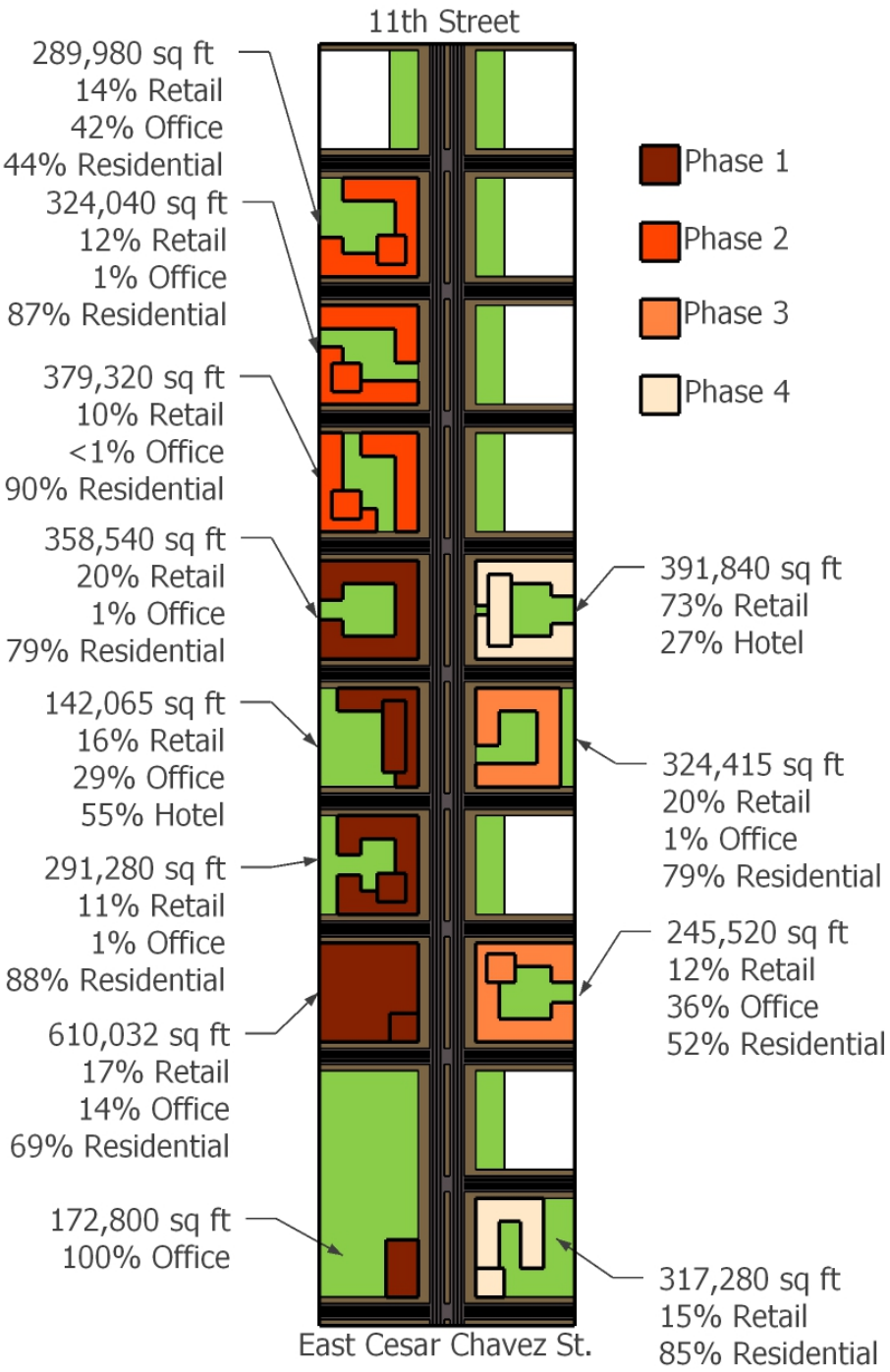

Figure 22: SketchUp Model of Building Layout from Cesar Chavez to 11th Street (Top View)

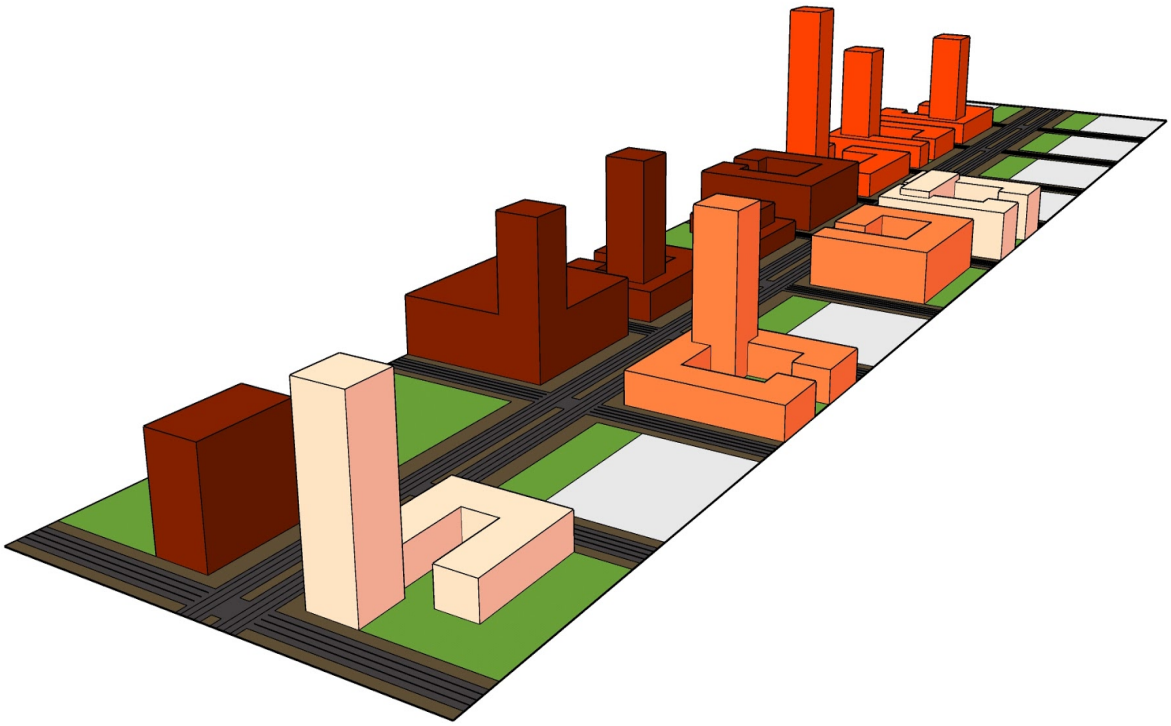

Figure 23: SketchUp Model of Building Layout from Cesar Chavez to 11th Street

Costs and Return on Investment

The median monthly per square foot prices for Downtown Austin Condos for the past 2 years were analyzed and an average of these prices has been considered.[13] The initial per square foot value of the proposed development has thus been assumed to be $517. Following are tables for economic analysis through Michael Oden's Fiscal Impact Model. All figures are conservative estimates:

City Revenue-Cost Analysis Operating & Annual Capital	**Preferred Estimate, Direct Value Property Tax, Per Resident Per Worker Basis for other Taxes and Expenditures**		
	Residential	**Non-Residential**	**Net Total**
Annual Revenues	$8,600,000	$6,000,000	$14,700,000
Annual Expenditures	$4,600,000	$2,600,000	$7,200,000
Revenue/Cost Ratio	1.86	2.35	2.04
Net Revenue (Cost)	$4,000,000	$3,500,000	**$7,500,000**
Analysis Period, Years	20	20	20
Cost of Capital @*	3.5%	3.5%	3.5%
Present Value of Net Revenue (Cost)	$56,900,000	$49,200,000	**$106,100,000**

Table 4: Costs and Revenues for the City of Austin

* A 3.5% discount rate has been used for Austin based on the Local Fiscal Impact Guidebook by Michael Oden

[13] https://austin.towers.net/condos/market-index/

Water Utility Revenue-Cost Analysis Operating & Annual Capital	Preferred Estimate, Per Resident, Per Worker Basis		
	Residential	**Non-Residential**	**Net Total**
Annual Revenues	$5,000,000	$5,200,000	$10,200,000
Annual Expenditures	$4,500,000	$4,600,000	$9,000,000
Revenue/Cost Ratio	1.12	1.14	1.13
Net Revenue (Cost)	$600,000	$700,000	**$1,200,000**
Analysis Period, Years	20	20	20
Cost of Capital @	3.50%	3.50%	3.50%
Present Value of Net Revenue (Cost)	$8,000,000	$9,000,000	**$17,000,000**

Table 5: Costs and Revenues from Utilities

K-12 Revenue-Cost Analysis Operating & Annual Capital	Preferred Estimate - Direct Property value Plus Per Student Estimate for (K-12) Basis*		
	Residential	**Non-Residential**	**Net Total**
Annual Revenues	$12,600,000	$7,900,000	$20,400,000
Annual Expenditures	$5,700,000	$0	$5,700,000
Revenue/Cost Ratio	2.22	-	3.60
Net Revenue (Cost)	$6,900,000	$7,900,000	**$14,800,000**
Analysis Period, Years	20	20	20
Cost of Capital @	3.50%	3.50%	3.50%
Present Value of Net Revenue (Cost)	$98,200,000	$111,700,000	**$209,800,000**

Table 6: Costs and Revenues for the Austin Independent School District

The model resides on the assumption of 0.13 students/household based on the Local Fiscal Impact Guidebook by Michael Oden. The assumption allows for the housing units to be family friendly.

Aggregated Revenue-Cost Analysis all Jurisdictions/Functions Operating & Annual Capital	Preferred Estimate - Direct Property Tax, Other Per Resident, Per Worker by Sector With Per Student for(K-12)Basis		
	Residential	**Non-Residential**	**Net Total**
Annual Revenues	$26,300,000	$19,100,000	$45,400,000
Annual Expenditures	$14,800,000	$7,100,000	$21,900,000
Revenue/Cost Ratio	1.78	2.68	2.07
Net Revenue (Cost)	$11,500,000	$12,000,000	**$23,400,000**
Analysis Period, Years	20	20	20
Cost of Capital @	3.50%	3.50%	3.50%
Present Value of Net Revenue (Cost)	$162,900,000	$170,200,000	**$333,100,000**

Table 7: Overall Costs and Revenues for the development proposal

* All the costs and revenues have been adjusted per inflation (from 2011-2018 @10.9%)[14]

Build-out period and phasing

Depressing and capping the highway will create space for the proposed development consisting of the following square footage as per the uses:

Retail : 780,030 sq ft

Office : 518,490 sq ft

Residential : 1,775 units (2,366,590 sq ft)

Hotel : 420 rooms (182,000 sq ft)

[14] http://www.in2013dollars.com/2011-dollars-in-2018?amount=1

The following table lays out the phasing proposal following average absorption trends based on the data obtained by Capitol Market Research.

	Retail	Office	Residential	Hotel	Total
	sq ft	sq ft	units @ 1000 sq ft/ unit @ 75%	rooms @ 325 sq ft/ room @ 75%	sq ft
Phase 1 Year 1-5	233,440	301,790	721	180	1,574,720
Phase 2 Years 6-10	117,170	125,320	563	-	993,340
Phase 3 Years 11-15	94,260	91,380	288	-	569,930
Phase 4 Years 16-20	335,160	-	202	240	3,847,110

Table 8: Phasing Proposal

The development mainly focuses on retail, office, and residential uses. Being near the heart of Downtown Austin, the new development would be civilized, accessible, walkable, bikeable, accessible by transit and attractive and these spaces will create business and generate revenues for the city. The proposed development would create more space for the expansion of downtown Austin towards the east. The hotel space will help cater to guests visiting Austin all year round. The first phase would be the first step towards reconnecting Austin: thoroughfares ensuring east-west connectivity and making the city one. The development will serve the pedestrian population walking along the boulevards in the heart of Austin. The following table consists of data regarding the estimated value of taxable property created over the course of different phases:

	Phase 1	Phase 2	Phase 3	Phase 4
	Cumulative Year 1-5	Cumulative Year 1-10	Cumulative Year 1-15	Cumulative Year 1-20
Value per sq ft (increases by 1.5% per year)	$549	$591	$636	$686
sq ft created/built (sq ft)	1,574,720	2,568,060	3,137,990	3,847,110
Taxable Property*	**865,000,000**	**1,518,000,000**	**1,996,000,000**	**2,639,000,000**

Table 9: Taxable property created (Cumulative)

* The property values have been rounded off to the nearest million dollars

Few of the other taxes that this development would generate include sales, hotel, and alcohol taxes. Though the estimation of these taxes is beyond the scope of this project, it should be noted that these taxes make up a huge portion of the revenues that is received by the taxing entities.

Conclusion

The proposal comprises of 4 phases over a period of 20 years, 5 years per phase. The 24.5 acres of right of way will cost around $500 Million to depress and cap. The proposed development over the next 20 years is expected to generate $333 Million in property taxes alone and will also generate sales, hotel, and alcohol taxes. After the completion of the project, the expected development is expected to generate about $23.5 Million in property taxes every year. The 780,000 sq ft of retail space would create a retail district which similar to the 2nd Street District and the Domain, will generate substantial economic activity, benefitting the taxing agencies and fiscally strengthening Austin.

The following excerpt is taken from page vii of City of Austin's 2017 Comprehensive Annual Financial Report- *"Another growth-related issue is traffic congestion. According to the Texas A&M Transportation Institute, Austin has the 7th worst traffic in the nation and traffic issues will continue to be exacerbated by future growth....."*[15] Keeping in mind Austin's rapid growth, it is time that we now take responsibility and move towards smarter solutions.

"We need to make an investment in [our] tax base" (Sinclair Black, personal communication, April 2018). This is to be achieved by planning in detail, establishing a development commission, establishing tax before anything is done. Tax Increment Financing (TIF) or Tax Increment Reinvestment Zones (TIRZ) can be established to capture base valuation so that we know the increment of change in value and that delta provides basis for selling bonds to build the project. Much of the infrastructure (utilities, city streets, etc.) is already built, and tapping into the existing facility is the key which could help offset development costs. This development will not be much of a liability for the city provided the site is accessible, leading towards lowered costs and increased revenues, and the city does not have to pay for the buildings. The lowered and capped highway will have many other benefits as well, including curbed pollution and better health of citizenry with increased pedestrian flow.

With plans for the Convention Center and Plaza Saltillo in the pipeline, this development can be the change that will restructure Austin's downtown and make it more hospitable for new businesses. This could create a lot of value for Austin, fiscally strengthen Austin by creating more

[15] https://assets.austintexas.gov/financeonline/downloads/cafr/cafr2016.pdf (page vii)

jobs, and curb air and noise pollution along the corridor leading to healthier environment. East / West connectivity will also open doors to greater business activity on the eastern side of I-35. This proposal focuses on Economic Development of Austin and also removes I-35 as a barrier to development and growth of Downtown Austin. This has been achieved by grade separation. The traffic on I-35 will flow below grade, allowing the surface to return to the city in the form of boulevards, reconnecting the urban fabric. This is all in alignment with the Great Streets Master Plan and Reconnect Austin's vision of a better and connected Austin.

The proposal aims at liberating blighted, unbuildable land and will allow Austin's downtown to expand without encroaching further eastward beyond the freeway right-of-way. Though this study focuses on a portion of I-35 corridor through downtown Austin, to begin with, the idea is to depress the highway from Holly Street to Martin Luther King Jr. Boulevard, a 1.53 mi stretch, and make space available for new development associated with the UT Medical Campus. Reconnect Austin, as a part of the Great Streets Master Plan advocates for a boulevard and a vision and commitment towards future improvements.

Appendix

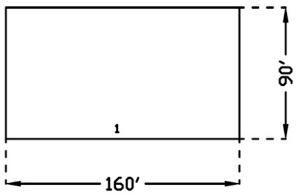

Figure 24: Layout of Building 1

Building-1 (172,800 sq ft)		
Footprint	14,400 sq ft	
Number of Floors	12	
Square Footage	172,800 sq ft	
Office	100 %	172,800 sq ft

Table 10: Specifications of Building 1

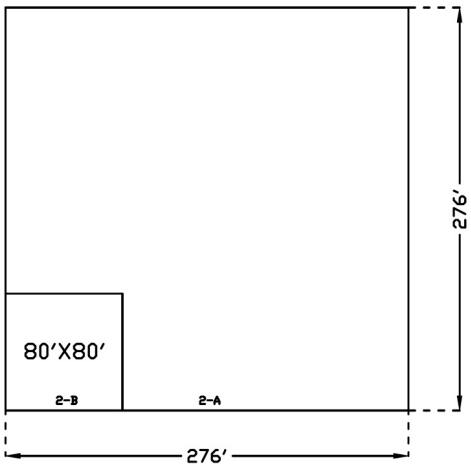

Figure 25: Layout of Building 2

Building-2 (610,032 sq ft)						
	2-A		2-B		Combined	
Footprint	76,176 sq ft		6,400 sq ft		82,570 sq ft	
Number of Floors	7		12			
Square Footage	533,232 sq ft		76,800 sq ft		610,032 sq ft	
Retail	20 %	106,650 sq ft	-	-	17 %	106,650 sq ft
Office	1 %	5,332 sq ft	100 %	76,800 sq ft	14 %	82,132 sq ft
Residential	79 %	421,250 sq ft	-	-	69 %	421,250 sq ft

Table 11: Specifications of Building 2

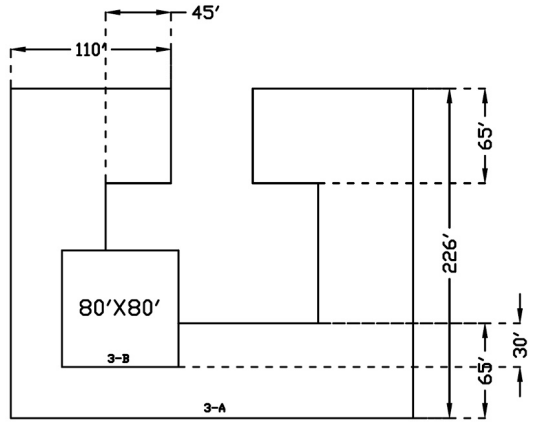

Figure 26: *Layout of Building 3*

Building-3 (291,280 sq ft)						
	3-A		3-B		Combined	
Footprint	40,820 sq ft		6,400 sq ft		47,220 sq ft	
Number of Floors	4		20			
Square Footage	163,280 sq ft		128,000 sq ft		291,280 sq ft	
Retail	20 %	32,660 sq ft	-	-	11 %	32,660 sq ft
Office	1 %	1,630 sq ft	-	-	1 %	1,630 sq ft
Residential	79 %	128,990 sq ft	100 %	128,000 sq ft	88 %	256,990 sq ft

Table 12: Specifications of Building 3

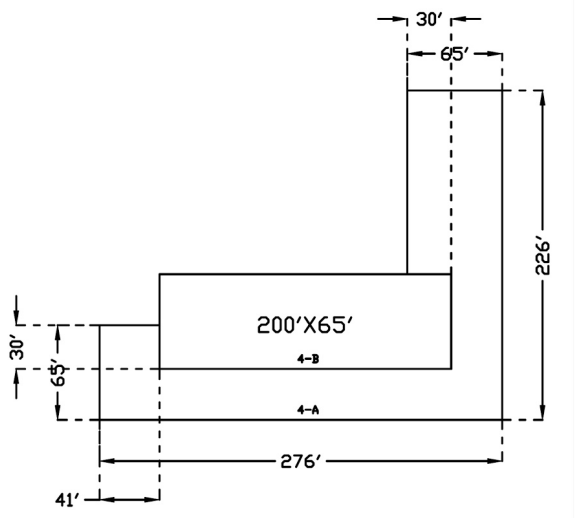

Figure 27: Layout of Building 4

Building-4 (218,865 sq ft)						
	4-A		4-B		Combined	
Footprint	21,355 sq ft		13,000 sq ft		34,355 sq ft	
Number of Floors	3		6			
Square Footage	64,065 sq ft		78,000 sq ft		142,065 sq ft	
Retail	35 %	22,423 sq ft	-	-	16 %	22,423 sq ft
Office	65 %	41,642 sq ft	-	-	29 %	41,642 sq ft
Hotel	-	-	100 %	78,000 sq ft	55 %	78,000

Table 13: Specifications of Building 4

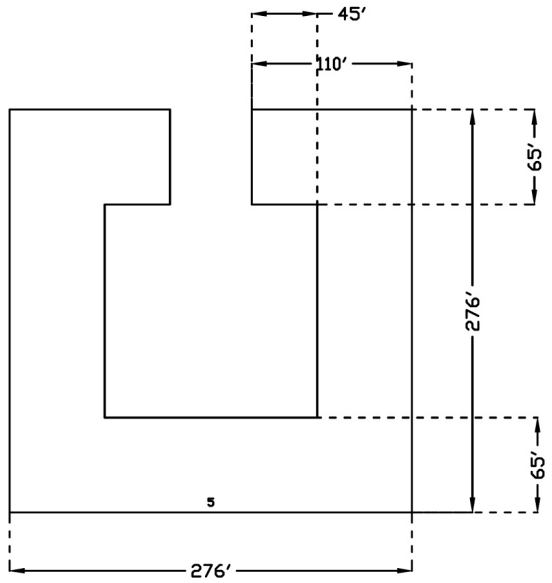

Figure 28: Layout of Building 5

Building-5 (358,540 sq ft)		
Footprint	51,220 sq ft	
Number of Floors	7	
Square Footage	358,540 sq ft	
Retail	20 %	71,710 sq ft
Office	1 %	3,590 sq ft
Residential	79 %	283,250 sq ft

Table 14: Specifications of Building 5

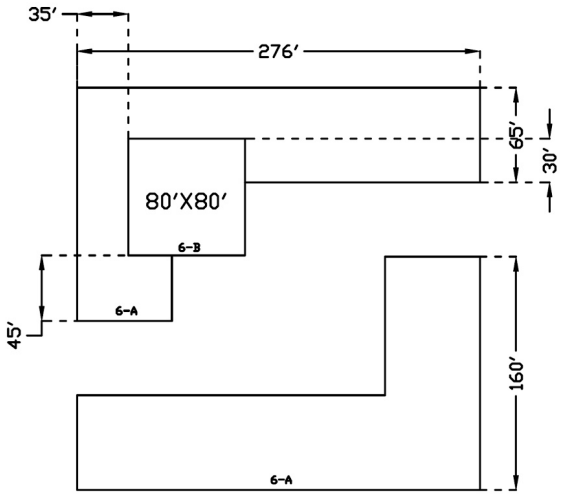

Figure 29: Layout of Building 6

Building-6 (379,320 sq ft)						
	6-A		6-B		Combined	
Footprint	46,830 sq ft		6,400 sq ft		53,230 sq ft	
Number of Floors	4		30			
Square Footage	187,320 sq ft		192,000 sq ft		379,320 sq ft	
Retail	20 %	37,460 sq ft	-	-	10 %	37,460 sq ft
Office	1 %	1,870 sq ft	-	-	< 1 %	1,870 sq ft
Residential	79 %	147,980 sq ft	100 %	192,000 sq ft	90 %	339,980 sq ft

Table 15: Specifications of Building 6

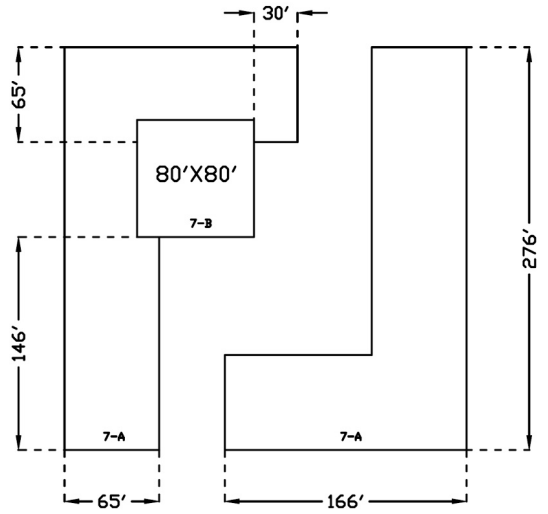

Figure 30: Layout of Building 7

Building-7 (324,040 sq ft)						
	7-A		7-B		Combined	
Footprint	49,010 sq ft		6,400 sq ft		55,410 sq ft	
Number of Floors	4		20			
Square Footage	196,040 sq ft		128,000 sq ft		324,040 sq ft	
Retail	20 %	39,210 sq ft	-	-	12 %	39,210 sq ft
Office	1 %	1,960 sq ft	-	-	1 %	1,960 sq ft
Residential	79 %	154,870 sq ft	100 %	128,000 sq ft	87 %	282,870 sq ft

Table 16: Specifications of Building 7

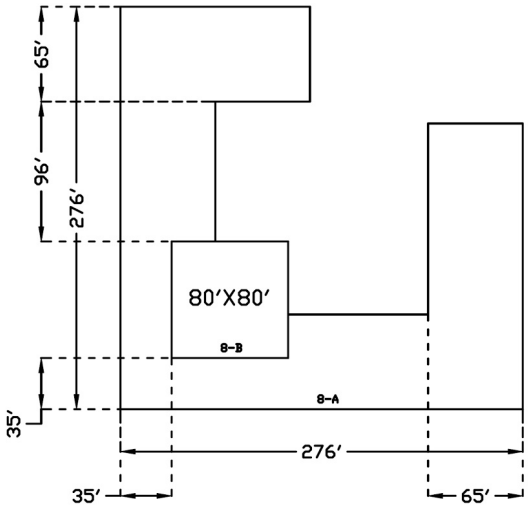

Figure 31: Layout of Building 8

Building-8 (289,980 sq ft)						
	8-A		8-B		Combined	
Footprint	40,495 sq ft		6,400 sq ft		46,895 sq ft	
Number of Floors	4		20			
Square Footage	161,980 sq ft		128,000 sq ft		289,980 sq ft	
Retail	25 %	40,500sq ft	-	-	14 %	40,500 sq ft
Office	75 %	121,490 sq ft	-	-	42 %	121,490 sq ft
Residential	-	-	100 %	128,000 sq ft	44 %	128,000 sq ft

Table 17: Specifications of Building 8

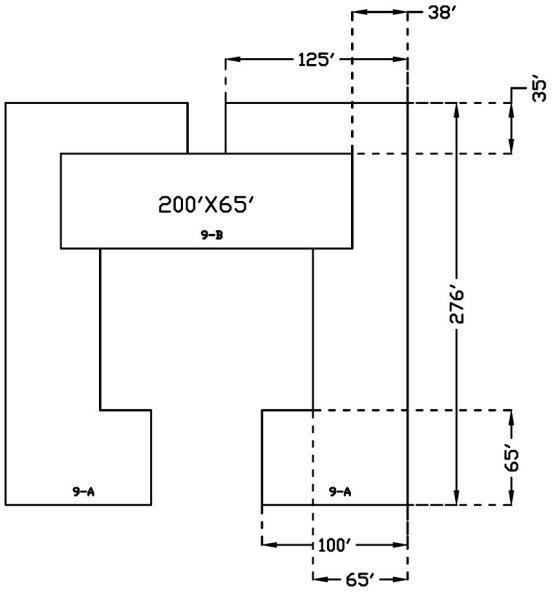

Figure 32: Layout of Building 9

Building-9 (391,840 sq ft)						
	9-A		9-B		Combined	
Footprint	41,120 sq ft		13,000 sq ft		54,120 sq ft	
Number of Floors	7		8			
Square Footage	287,840 sq ft		104,000 sq ft		391,840 sq ft	
Retail	100 %	287,840 sq ft	-	-	73 %	287,840 sq ft
Hotel	75 %	121,490 sq ft	100 %	121,490 sq ft	27 %	121,490 sq ft

Table 18: Specifications of Building 9

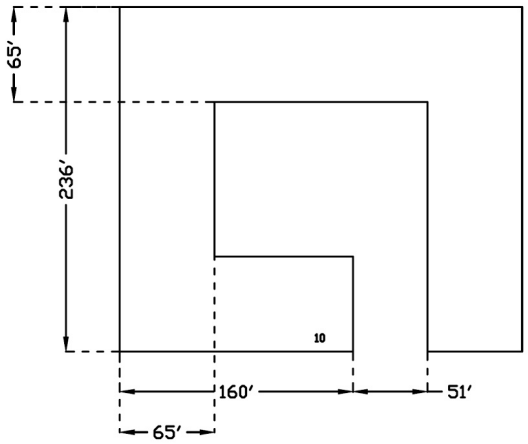

Figure 33: Layout of Building 10

Building-10 (324,415 sq ft)		
Footprint	46,345 sq ft	
Number of Floors	7	
Square Footage	324,415 sq ft	
Retail	20 %	64,880 sq ft
Office	1 %	3,240 sq ft
Residential	79 %	256,290 sq ft

Table 19: Specifications of Building 10

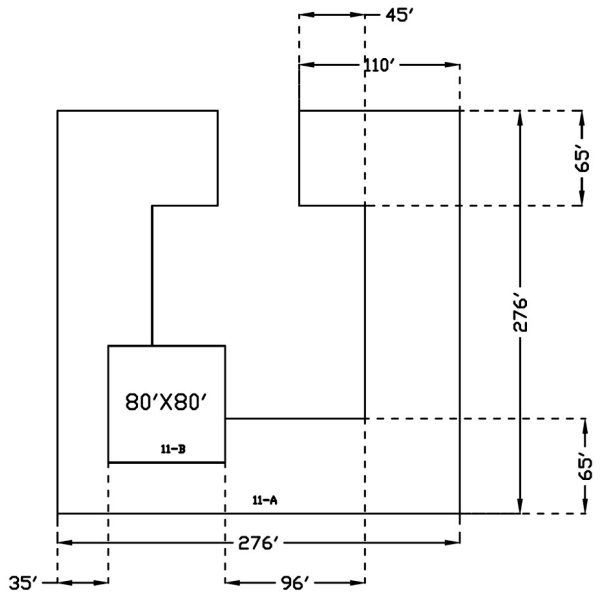

Figure 34: Layout of Building 11

Building-11 (245,520 sq ft)						
	11-A		11-B		Combined	
Footprint	29,380 sq ft		6,400 sq ft		35,780 sq ft	
Number of Floors	4		20			
Square Footage	117,520 sq ft		128,000 sq ft		245,520 sq ft	
Retail	25 %	29,380 sq ft	-	-	12 %	29,380 sq ft
Office	75 %	88,140 sq ft	-	-	36 %	88,140 sq ft
Residential	-	-	100 %	128,000 sq ft	52 %	128,000 sq ft

Table 20: Specifications of Building 11

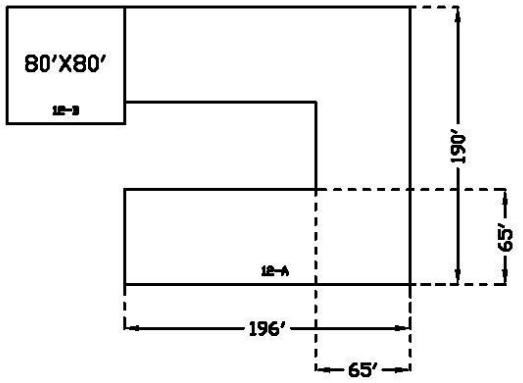

Figure 35: Layout of Building 12

Building-12 (317,280 sq ft)						
	12-A		12-B		Combined	
Footprint	47,320 sq ft		6,400 sq ft		35,780 sq ft	
Number of Floors	4		20			
Square Footage	189,280 sq ft		128,000 sq ft		245,520 sq ft	
Retail	25 %	47,320 sq ft	-	-	15 %	47,320 sq ft
Residential	75 %	141,960 sq ft	100 %	128,000 sq ft	85 %	269,960 sq ft

Table 21: Specifications of Building 12

Vita

Sarthak Gupta is from Hardoi, India. He completed high school from Wynberg Allen School, Mussoorie and moved to south India for undergraduate studies. He received a Bachelor of Technology in Civil Engineering from Vellore Institute of Technology, Vellore. In August 2016, he entered the University of Texas at Austin to pursue his masters degree in Community and Regional Planning. After graduating he plans to work in real estate development as a planner and a civil engineer.

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This report was typed by the author.